

Welcome to the Biweekly Restoration Information Update Page. This web site

- Provides current information on wetland and river corridor restoration projects
- Recognizes outstanding restoration projects
- Provides a forum for information sharing

We welcome the submission of articles and announcements related to your restoration project. Just send your write-up to EPA's contractor at restorationupdate@tetrattech-ffx.com or mail it to Kathryn Phillips, Biweekly Restoration Update Coordinator, Tetra Tech, Inc., 10306 Eaton Place, Suite 340, Fairfax, VA 22030. We will carefully consider your submission for inclusion in a future update. If your submission is selected, please note that it might be edited for length or style before being posted. Because this web site is meant to be a public forum on restoration information, we cannot post any information that is copyrighted or information that serves or has the appearance to serve as advocating or lobbying for any political, business, or commercial purposes.

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- [News and Announcements](#) - This section includes up-to-date information on regulatory issues affecting restoration, conference and workshop announcements, and other newsworthy tidbits.
- [Restoration-Related Web Sites](#) - Check out other groups on the Web that are helping in the effort to restore wetlands and river corridors.
- [Information Resources](#) - Books, journals, fact sheets, videos, and other information resources to aid you in your restoration project are provided here.
- [Ask a Restoration Question](#) - Post your restoration related question. Answers will be provided by the EPA and Bi-Weekly readers.

Feature Article

The Las Vegas Wash is a perennial stream that supports unique wetlands in the middle of the Mojave Desert. The Wash, originally a spring-fed channel formed 6,000 to 14,000 years ago, is located in the southeastern part of the 1,600-square-mile Las Vegas Valley watershed in Nevada. Until the area was settled in the early 1900s, the Wash had been dry for an estimated 1,000 to 4,000 years. Settlement introduced impervious areas, residential and agricultural water use, and treated effluent into the basin, causing the Wash to flow again and ultimately to transform a 12-mile stretch of sandy desert into a lush wetland oasis. By the 1970s the Las Vegas Wash supported more than 2,000 acres of wetlands. Unfortunately, as population continued to increase, the water that created the wetlands began to overwhelm the system and break it down. Area residents recognized the importance of this unique wetland resource and are now working to restore and protect it from further degradation.

What Is the Problem?

As population grew throughout the mid-1900s, stormwater, urban runoff, shallow ground water, and highly treated effluent drained out of the valley and spread out gradually across the wash. Over the years, sediment from the water settled out and created the soil necessary for the establishment of wetland plants. The cattails and reeds that established themselves in the wash were nourished by the water moving slowly through the wide channel.



By the 1970's Las Vegas had begun to urbanize at an increasing rate. Continually increasing effluent flows and urban runoff began to negatively impact the Wash. The increased volume of water moved too quickly to gradually spread out. Instead, it cut channels into the sandy soil. Outlying wetland plants withered because the water no longer reached them. Along the channels, vegetation was stripped from the soil by the rapidly moving water. Since the 1970's population explosion, the 2,000 acres of wetlands have been reduced to only 200 acres.



Finding a Solution

In 1998, the Las Vegas Wash Coordination Committee was formed to address the complex issues surrounding the Wash. The Committee is made up of 28 member organizations, including local municipal districts, conservation groups, area businesses, and federal agencies. The Committee meets regularly to identify issues facing the Wash and to develop recommendations for restoration. They are currently focusing on 3 issues: erosion control, environmental monitoring, and wetland construction/restoration.

Erosion control is the primary focus of engineers working to restore the Wash. "All of the other things we are trying to achieve—restoring wetland vegetation and increasing wildlife habitat—can't be accomplished until we stabilize the Wash," explains Gerry Hester, an engineer working on the Wash project. Engineers have installed 4 erosion control structures along the Wash to slow the water and reduce erosion. Eventually the Wash committee plans to install 22 erosion

control structures along the Wash ranging from concrete weirs to streambank reinforcement with deep-rooting trees.

Area volunteers are also enthusiastic about restoring native vegetation to the area. Through the Las Vegas Wash Green-up Program, more than 500 local volunteers have donated their time over the past few years to plant some 10,000 trees and shrubs on 7 acres surrounding the Wash. Additional plantings are planned, but first the land must be cleared of quickly reproducing invasive species such as tamarisk, fountain grass, tall whitetop, and *Arundo donax*, that outcompete native vegetation for water. Land preparation is underway by many of the Committee member agencies. A second Green-up day is scheduled for February 2002, and Committee members are encouraging widespread citizen participation. The Las Vegas Wash Committee is funded primarily through Committee member agencies. The Southern Nevada Water Authority, a member of the committee, is the project administrator. For more information on the Las Vegas Wash project, visit the web site www.lvwash.org [EXIT disclaimer](#), or contact the Las Vegas Wash Project Coordination Team, 1900 East Flamingo Suite 255, Las Vegas, Nevada 89119. Phone: (702) 822-3300; e-mail: info@lvwash.org.

If you'd like your project to appear as our next Featured Article, e-mail a short description to restorationupdate@tetrattech-ffx.com.

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Five-Star Restoration Projects Update

The goal of EPA's Five-Star Restoration Program is to bring together citizen groups, corporations, youth conservation corps, students, landowners, and government agencies to undertake projects that restore streambanks and wetlands. The program provides challenge grants, technical support, and peer information exchange to enable community-based restoration projects. A few five-star restoration projects are being revisited to see if the modest amount of funding (between \$5,000 and \$20,000) has helped the local restoration partners achieve their goals.

Project Name: Wetland Restoration in the Elkhart River Corridor

Five Star Grant: \$10,000

Grant to: City of Elkhart

Location: Elkhart, Indiana

Proposal:

The City of Elkhart will restore 6 acres of wetlands and riverbank along the Elkhart River. This project is part of a 5-year effort to develop a 120-acre River Greenway Trail along the urban river corridor. Project partners include Elkhart EnviroCorps, scout troops, Notre Dame University, and other community groups.

Update:

The goal of the wetland restoration project is to protect and preserve wetlands and wetland-associated uplands within the corridor of the Elkhart River. To date the City of Elkhart has purchased more than 25 acres from willing sellers, in addition to the 12-acre parcel on which the Elkhart Environmental Center is located.

Project partners worked to correct the degradation caused by years of urban stress on the land. EnviroCorps workers, who contributed more than 120 hours to the project, were able to remove invasive species from Elkhart's newly acquired property and plant more than 8,000 native plants along the banks of the river. The native plants prevent erosion and encourage greater biodiversity in the floodplain. More than 140 local volunteers donated a combined 230 hours to remove more than 2,000 pounds of trash from the worksite. The project team also built a stairway to allow visitors easy access to the newly developed trail system, and the Elkhart Street Department removed 540 tons of debris from the wetland site using heavy machinery.

The community has responded enthusiastically to the project. The Elkhart Truth and The Paper printed articles about the project when the grant was announced. Those articles helped raise awareness among the community about the restoration project, and community interest and excitement grew as the project progressed.

This restoration project is expected to continue for the next couple of years. The city plans to purchase a 1.5-acre piece of property that will further link the trail system. In the future, other floodplain areas will be restored as part of the city's plan to construct a 165-acre river greenway that will serve as a natural park along the Elkhart River.

Project Title: Rebuilding Herman Pond at Ranch San Rafael

Five Star Grant: \$10,000

Grant to: Private Industry Council of Northern Nevada

Location: Reno, Nevada

Proposal:

The private Industry Council of Northern Nevada will partner with at-risk youth, Washoe County Parks, and Truckee Meadows Trail Association to restore wetlands along the Truckee River and Rancho San Rafael Park. The restored habitat will complement a community-wide effort to create biking and hiking trails along the river. Environmental education and job skills training will also be part of the project.

Update:

The Washoe County Parks and Recreation Department identified a list of restoration activities in which the youth could participate. The projects all focused on restoring a section of Evans Creek, which flows into Herman Pond before passing through the park and joins the Truckee River downstream. The Division of Youth Services provided a crew of 10 youth to take part in the program. The youth were scheduled to work 32 hours per week. They spent their time learning basic employment skills, taking part in restoration efforts, and learning about the environment they were restoring. Parks and Recreation Department staff, Juvenile Services staff, and a local teacher hired to assist with the project supervised the youth for the 9-week program. Over the course of the program, the youth and their supervisors built 2,500 yards of fencing to exclude cattle from the creek; removed star thistle, an invasive plant, from two-thirds of an acre around the creek and pond; cleared 400 feet of trail; and restored a 2-acre section of Herman Pond.

For more information on EPA's Five-Star grant program, visit

<http://www.epa.gov/owow/wetlands/restore/5star>.

Community-Based Restoration Partnerships

Community Joins Together to Preserve Hatchie River and Bottomland Forest

According to the American Rivers' RiverCurrents e-newsletter (issue 09/28/2001), the bottomland forest of the Hatchie National Wildlife Refuge, located along Tennessee's Hatchie River, is dying from excessive sediment flowing into the river from silt laden tributaries. The Knoxville News-Sentinel reported that the Hatchie River is one of the few remaining large streams in the Lower Mississippi Valley that has never been channelized. However, channelized tributaries are putting stress on the Hatchie River. Each year, the Hatchie River floods in response to the increased flow of its channelized tributaries, and silt carried in the fast moving water is deposited throughout the bottomland forests lining the Hatchie's banks. When the flood waters recede, the roots of oaks and other trees are covered with silt and are unable to breathe. It is estimated that silt-laden floods lead to the deaths of more than 100 acres of trees in the 11,556-acre refuge each year. The West Tennessee River Basin Authority, the Natural Resources Conservation Service, the Tennessee Department of Agriculture, and Nature Conservancy of Tennessee are trying to fix the problem. The first project undertaken by the restoration team was to install grade-control structures and re-grade slopes along Richland Creek. The restoration team hopes its efforts will decrease flow rates in Richland Creek and reduce the amount of sediment deposited in the Hatchie River. Citizens are encouraged to take part in the restoration effort. The Nature Conservancy sponsors tree planting and trash clean-up days to improve the conditions along the waterway. The Nature Conservancy and the U.S. Fish and Wildlife Service are also working together to double the size of the Lower Hatchie National Wildlife Refuge. For more information on the Hatchie River preservation effort, visit www.hatchie.com. [\[EXIT disclaimer\]](#)

The Thornton Creek Alliance Encourages Community Involvement in Stream Care

The Thornton Creek Alliance is a nonprofit, grassroots organization dedicated to preserving and

restoring the Thornton Creek watershed located northeast of Seattle. The Alliance encourages individuals, schools, groups, businesses, and government agencies to work together to improve the watershed. The Alliance has addressed water quality, stabilization of water flow, flood prevention, reforestation, habitat improvement, stream-bank stabilization, open-space acquisition, community involvement, and education-related projects.

Over the past 5 years, the Alliance has tackled several restoration projects. In 1997, the Alliance supported the construction of 2 frog ponds near the South Fork of Thornton Creek. They coordinated the efforts of a local scout troop, who planted native vegetation around the ponds to serve as frog habitat. The following year, the Alliance sparked interest in the restoration of the southern part of Matthew's Beach Park. The restoration work was completed by the Seattle Department of Parks and Recreation and the U.S. Army Corps of Engineers. Construction crews diverted a small creek into a new stream channel that feeds a pond before flowing into Thornton Creek. The pond helps improve water quality in Thornton Creek by allowing sediment to settle before water enters the creek. Volunteers restored habitat around the pond by replacing invasive vegetation with native plants. Currently, the Alliance is working with Seattle Public Utilities and the Jackson Golf Course to create 3 golf course ponds. Two of the ponds will serve as rainfall storage and the third pond will be used to increase fish habitat. The rainfall storage ponds will benefit the creek by reducing the flow of water in the creek during rain events. Visit the Thornton Creek Alliance web site at www.scn.org/earth/tca/index.htm [EXIT disclaimer](#) to learn more about past and future projects undertaken by the Alliance.

If you are part of an innovative community-based partnership that is working to restore river corridors or wetlands, we'd like to hear from you. Please send a short description of your partnership to restorationupdate@tetrattech-ffx.com.

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Achieving Restoration Results

Multiple Best Management Practices Implemented On the Rice Cattle Farm Over the past year and a half, numerous best management practices (BMPs) have been implemented on the Rice Cattle Farm located in Albany Township, Pennsylvania, along an unnamed tributary of Maiden Creek. David Lopez, a Natural Resources Conservation Service Engineer, worked with David Rice, a cattle farmer, and several Berks County Conservation District Technicians to design a nutrient management plan for the Rice Cattle Farm. The management plan includes (1) the construction of a concrete walkway between the barn and the feeding area that captures nutrient-rich water and directs it to a manure pit, (2) the installation of streambank fencing along the pasture area, and (3) plans to line 2 trench silos with concrete to direct leachate (a liquid solution that forms as water percolates through the silage) into a grassed swale before it enters the stream.

Rice sought the help of multiple funding programs to make the installation of the BMPs possible. He received \$30,000 under the Clean Water Act's Section 319 Grant Program, \$100,000 from a Pennsylvania Growing Greener grant, \$20,000 from the Berks County Conservation District as reimbursement for fencing and concrete pad materials costs. David Rice will keep nutrient management as a top priority on his farm in the future. For more information, contact Pamela Spayd, Watershed Specialist at the Berks County Conservation District at (610) 372-4657 or e-mail pspayd@bccd.org.

Dying Trees Indicate Progress Along the Kissimmee River

Fifteen miles of meandering river have been restored in the Kissimmee Watershed in Florida. Since the 1960s the Kissimmee River between Lake Kissimmee and Lake Okeechobee has been a straight, slowly moving canal dug to protect Florida cities like Orlando and Kissimmee from floodwaters. Despite the benefits in flood control, the ecological consequences of the project soon became apparent. The floodplain was drained and transformed from wetlands to pastureland. Soon more than 90 percent of the area's wading birds had disappeared, 70 percent of bald eagle nesting habitat was lost, and the oxygen-depleted canal was no longer capable of supporting sport fish species. The U.S. Army Corps of Engineers is now working to undo some of the damage.

Phase one of the Kissimmee River restoration project began in 1999. The Army Corps filled 7.5 miles of canal north of Lake Okeechobee with dirt, forcing the river to return to its original meandering path. The river, now flowing through 15 miles of historic river channel, provides nourishing water to the surrounding mile-wide floodplain. Wax myrtle trees can no longer survive in the water covered floodplain, and wetland vegetation has once again taken hold. Wood storks, migrating blue-winged teal, white ibis, herons, and egrets have returned to the area.

Phases two and three of the project will restore an additional 28 miles of the Kissimmee River to its original channel. By completion of the project in 2010, costs are expected to reach \$500 million. Once completed, the project is expected to recreate 27,000 acres of wetlands. For more information on the restoration project, visit www.sfwmd.gov/org/erd/krr. [EXIT disclaimer](#)

If you are part of an innovative restoration project that has had positive results, we'd like to hear from you. Please send a short description of your project to restorationupdate@tetrattech-ffx.com.

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Funding for Restoration Projects

National Wildlife Federation 2002 Species Recovery Fund

Applications are now being accepted for National Wildlife Federation's 2002 Species Recovery Fund (SRF). The fund was created to spur habitat restoration efforts, species reintroduction projects, and other creative endeavors that will directly improve conditions for the endangered species featured in the Federation's Keep the Wild Alive campaign. Species that benefit from wetland habitat include the piping plover, whooping crane, and Ouachita rock pocketbook mussel. Priority is given to projects that also incorporate a public outreach component and can be easily replicated. Grants will range between \$3,000 and \$7,000 and will be available to organizations, individuals, agencies, tribes, and universities. Applications must be received by February 15, 2002. For more information, visit www.nwf.org/wildalive [EXIT disclaimer](#), or contact YinLan Zhang at 202-797-6892, or email zhang@nwf.org.

Please send any news you have on funding mechanisms available to local community organizations to restorationupdate@tetrattech-ffx.com.

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News and Announcements

More than \$20 Million Promised for Watershed Protection

President Bush will include \$21 million in his 2003 budget for a new EPA initiative to protect, preserve, and restore waterways across the country. This effort was announced by EPA Administrator Christie Whitman during a visit to the Minnesota Valley National Wildlife Refuge in the Minneapolis/St. Paul area.


This announcement comes in response to water quality problems including habitat loss and alteration, nutrient enrichment, pathogens, and invasive species that continue to harm watersheds nationwide. These problems prevent our resources from meeting water quality goals and deprive the public of economic, recreation, and drinking water opportunities. The problems are complex and require local assessment, involvement, and commitment. This new program will allow EPA to target up to 20 of this country's most highly-valued watersheds for grants in a community-based initiative. This program will work with state governors, tribes, and local communities in their efforts to expand and improve existing protection measures with tools, training, and technical assistance. This investment will capitalize on the lessons learned from existing community-based protection efforts.

"President Bush understands the importance of watershed protection and he is taking action to make America's waterways cleaner and healthier for the families that enjoy them," Whitman commented. "In his 2003 budget, President Bush has included \$21 million for a new EPA initiative to copy successful approaches and techniques to protect highly valued watershed resources throughout the country. With the President's commitment to watershed protection, I am

confident that we can preserve and protect our precious waterways for future generations." Information on the watershed program is available at: www.epa.gov/owow/watershed.

Habitat Restoration Earns Conservation Awards


Tennessee Valley Authority (TVA) and Wetland Biologist Kim Pilarski have earned conservation awards from the Alabama Waterfowl Association (AWA) for work on a wetland-restoration project in Jackson County, Alabama. AWA awarded TVA the Environmental Initiative Award, and Pilarski received a Wetland Stewardship Award for her contributions.

Over the past two years TVA and Pilarski have worked in partnership with AWA to restore wetland habitat for wildlife and waterfowl along Mud Creek in Fackler, Alabama. The creek is listed as an impaired waterway because of poor water quality conditions caused by pollution from agricultural runoff. TVA and AWA have transferred ownership of the 80-acre restoration site to the Game and Fish Division of the Alabama Department of Conservation and Natural Resources. For more information, visit the Alabama Waterfowl Association web site (www.alabamawaterfowl.org ) under 2001 Conservation Awards.

EPA Announces Decision to Move Forward with Hudson River Cleanup

EPA Administrator Christine Whitman announced on December 4, 2001, that the Administration will proceed with the Hudson River cleanup. EPA has forwarded the Record of Decision to the State of New York for its 3-week review of the dredging project that will remove PCBs (polychlorinated biphenyls) from the river. The PCBs were deposited over a 30-year period from two General Electric plants in Fort Edward and Hudson Falls, New York, which manufactured electric capacitors. "We are going ahead with this important cleanup," said Whitman. "We will do so with a continuing open process that will involve all parties. The affected communities also will have the opportunity to comment on all siting issues." To learn more, view the press release from the EPA newsroom site (www.epa.gov/epahome/newsroom.htm) under press releases for December 4, 2001.

New Department of Agriculture Programs to Protect Water Quality The U.S. Department of Agriculture (USDA) announced funding for 2 programs that will benefit water quality and wildlife in Arkansas and New York. The Arkansas Conservation Reserve Enhancement Program (CREP) received \$10 million to target 4,700 acres in central Arkansas. The program will provide additional financial incentives for farmers to restore riparian buffers in the Bayou Metro Watershed.

The city of Syracuse received \$900,000 in CREP monies to help safeguard one of the city's major unfiltered drinking water supplies, Skaneateles Lake. The Syracuse CREP will pay farmers to remove up to 1,000 acres of cropland or marginal pastureland from agricultural production. The program will reimburse producers for installing and restoring riparian buffers that keep sediment, nutrients, and pollutants from entering the lake. For more information on the new USDA programs, visit <http://ens-news.com/ens/dec2001/2001L-12-17-09.html> [Link no longer available, October 2003]. USDA press releases can be viewed at www.usda.gov/news/releases/2001/12/december.htm. 

Upcoming Conferences and Events

Internet-Based Training Modules Offered on Watershed Management Topics

The Watershed Academy Web is a distance learning program offering self-paced training modules that provide a basic but broad introduction topics in watershed management. A Watershed Training Certificate is awarded for completing a series of 15 modules and passing the tests. There are over 40 modules on a variety of topics, including watershed ecology; watershed change, analysis, and planning; management practices; and community and social context.

The length and complexity are variable, but most modules are at the college freshman level of instruction. Watershed Academy Web uses a variety of web-based formats, such as slide shows with narrative text, interactive exercises, online downloadable documents, hot links to related sites, and interactive self-tests. Modules cover subjects about which watershed managers need

officials, involved citizens, decision makers, and others should have knowledge.

For more information on EPA's Watershed Academy Web online training program, visit the Web at www.epa.gov/watertrain or contact Anne Weinberg at (202) 260-7107 or weinberg.anne@epa.gov.

Headwater Habitats: The Importance of Native Plant and Animal Diversity

February 16, 2002

State College, Pennsylvania

This meeting will address the importance of biodiversity and native biota for maintaining and improving the quality of upstream aquatic and terrestrial communities. The meeting will serve as a vehicle to promote sharing of ideas between diverse groups with common interests and causes. Keynote speaker will be Dr. Sue Thompson of the Pennsylvania Biodiversity Partnership. For more information, visit www.outreach.psu.edu/c&i/coldwaterconservation. [EXIT disclaimer >](#)

The 3rd Annual National Invasive Weeds Awareness Week

February 25—March 1, 2002

Washington, DC

To be held in Washington, DC, "National Invasive Weeds Awareness Week 2002" (NIWAW III) will allow people and groups from across the country to focus national attention on the severe problems created by invasive weeds. NIWAW III events, including policy breakfasts, poster sessions, and congressional events, are designed to focus on the important and critical role that the federal government must play to help the United States deal with the problem of invasive weeds. NIWAW III is being sponsored by the Invasive Weeds Awareness Coalition, a Washington, DC-based coalition dedicated to increasing both federal and public awareness of the problems and needs associated with invasive weeds. NIWAW III's events will be open to the public, and further details will be distributed as they become available. Additional information will also be posted on the NIWAW website at www.nawma.org/niwaw.htm. For more information, contact Mike Ielmini at (703) 358-2340 or e-mail michael_ielmini@fws.gov.

PREVIOUS LISTINGS

Northwest Stream Restoration Design Symposium

January 31—February 2, 2002

Skamania Lodge, Washington

The Center for Water and Environmental Sustainability; the Civil, Construction, and Environmental Engineering Department at Oregon State University; and the City of Portland's Bureau of Environmental Services are sponsoring this symposium to advance the state of practice for professionals involved in stream restoration projects. The symposium will focus on restoration questions of concern to project planners, designers, managers, regulators, and owners. The program addresses urban stream restoration; use of wood versus rock in stream restoration projects; stream restoration design approaches, methods, and analyses; adaptive management during construction and thereafter; and dam removal and reestablishment of a riparian environment. Emphasis is placed on constructed projects and the lessons learned that can be used in other projects. For more information, visit www.cwest.orst.edu. [EXIT disclaimer >](#)

The Ecology and Management of Rare Plants of Northwestern California

February 6—8, 2002

Arcata, California

This conference will provide current information to enhance rare plant management in northwestern California and southeastern Oregon. Invited speakers will deliver overviews of major taxa and issues in three main areas: autecology and life history; survey and monitoring; and management, protection, and restoration. Contributed oral and poster presentations will offer perspectives on new research and findings, as well as illustrating examples of successful programs, approaches, and case studies. In addition, the symposium will provide an opportunity for biologists, natural resource professionals, planners, and policy makers to share their concerns and knowledge about rare plant issues and to formulate research and education needs. For more information, visit www.northcoast.com/~cnps [EXIT disclaimer](#).

Restoration-Related Web Sites

[The Los Angeles River Connection](#) [EXIT disclaimer](#)

web site offers diverse resources related to the history and management of the Los Angeles River. The site, developed in part by students from the Los Angeles area, offers links to a virtual river tour, maps, lesson plans, riparian resources, and river-related organizations. *This site would be useful for anyone interested in ongoing restoration and protection efforts in the Los Angeles River watershed.*

[The Corkscrew Swamp Sanctuary](#) [EXIT disclaimer](#) web site offers a virtual tour of southwestern Florida's Corkscrew Swamp. Visitors can experience several distinct habitats found along the Sanctuary's 2.25-mile raised boardwalk, including pine flatwood, wet prairie, marsh, lettuce lakes, and cypress forest (the largest remaining stand of ancient bald cypress in North America.) This site would be useful for someone interested in learning about wetland habitats of southwestern Florida.

[National Water Quality Assessment Program \(NAWQA\)](#) [EXIT disclaimer](#) has been collecting and analyzing data and information since 1991. USGS scientists have collected data in more than 50 major river basins and aquifers across the nation. The goal is to develop long-term consistent and comparable information on streams, ground water, and aquatic ecosystems to support sound management and policy decisions. Data, publications, summary reports, and maps are available from the web site. This site would be useful for anyone seeking hard scientific data on the water quality of a specific waterway.

[The Bog Home Page](#) [EXIT disclaimer](#) provides the definition of a bog and lists links to other sites that address bogs. The site also lists noteworthy bogs located around the United States with links for more information if available. This site would be useful to anyone seeking information on bogs.

[Office of Ocean and Coastal Resource Management](#) [EXIT disclaimer](#) is responsible for administering the Coastal Zone Management Act and has expertise on the Nation's coastal, estuarine, and ocean management issues. Information about current events, publications, the Coastal Zone Management Act, and major issues facing coastal managers is available through this site. This web site provides information for coastal resource managers, planners, educators, scientists, and others interested in balancing conservation and development along our nation's coast.

[San Francisco Bay Joint Venture](#) [EXIT disclaimer](#) is a partnership of public agencies, environmental organizations, the business community, local governments, the agricultural community, and landowners working cooperatively to protect, restore, increase, and enhance wetlands and riparian habitat in the San Francisco Bay watershed. The site provides information on current projects, events, and community involvement opportunities. This site would be useful for anyone seeking information on or wishing to get involved in restoration activities in the San Francisco Bay watershed.

[The Northern Gulf of Mexico Littoral Initiative](#) [EXIT disclaimer](#) is a program working to gather meteorological observations and water quality information, including temperature, salinity, oxygen, current velocity, and sediment data, along the Mississippi coast. The NGLI program invites endless possibilities for using the vast amount of data being collected to model the

impacts of coastal developments on the environment. This site would provide useful data for anyone wishing to model coastal conditions along the Gulf of Mexico coast.

Natural Resources Defense Council: Everglades [EXIT disclaimer](#) The Natural Resources Defense Council works with other environmental groups in south Florida to oversee the decision-making processes that affect water management for the region, pressing for a system that closely replicates the Everglades' natural water flows and safeguards its water quality. Links to related everglades topics and current events are provided by this site. This site would be useful to anyone wishing to learn more about large-scale restoration efforts.

RiverLink [EXIT disclaimer](#) is a regional organization spearheading the economic and environmental revitalization of the French Broad River and its tributaries as a place to work, live, and play. It includes a page on GIS Management Models to Assist Wetland Restoration Efforts in Buncombe and Haywood Counties, North Carolina. This web site would be useful for anyone seeking information on how to improve water quality in their local watershed. Suggested methods can be adapted for use in watersheds throughout the country.

Wetlands Restoration Fact Sheet [EXIT disclaimer](#) Maintained by the University of Georgia, Savannah River Ecology Laboratory, this site contains basic wetland information as well as links to research studies about restoring various types of degraded wetlands. This site would be useful to anyone researching watershed restoration methods.

Let us know about your restoration-related web site. Please send relevant URLs to restorationupdate@tetrattech-ffx.com.

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Information Resources

Two New Studies released by the USGS Northern Prairie Wildlife Research Center

Duck Populations as Indicators of Landscape Condition in the Prairie Pothole Region

Published by USGS, 2001

This study examines subdivisions of the prairie pothole region and categorizes them according to quality of duck habitat. The study also addresses the impact of agricultural development on breeding duck populations. The study can be found at

www.npwrc.usgs.gov/resource/2001/dpopland/dpopland.htm. [EXIT disclaimer](#)

Use of Macroinvertebrates to Identify Cultivated Wetlands in the Prairie Pothole Region

Published by USGS, 2001

This study explored the possibility of using dried remains of invertebrates or their egg banks to identify wetlands in intensely farmed areas in the prairie pothole region. The results demonstrated that shells, exoskeletons, head capsules, eggs, and other remains of macroinvertebrates can be used to identify wetlands, even when they are dry, intensively farmed, and difficult to identify as wetlands using standard criteria (i.e., hydrology, hydrophytic vegetation, and hydric soils). The study can be found at

www.npwrc.usgs.gov/resource/2001/macrouse/macrouse.htm. [EXIT disclaimer](#)

Ways to Conserve Wyoming's Wonderful Open Lands

A project of Governor Jim Geringer's Open Spaces Initiative, 1997

This guide book summarizes the legal methods of conserving open space in Wyoming. It explains tools available to the landowner, including conservation easements, donated lands, and sale of development rights, as well as regulatory techniques, including zoning and voluntary agreements. For more information or an online version of the guide book, visit

www.state.wy.us/governor/openspace/openspaces.htm [link no longer available, October 2003]; or to obtain a published version of this guide book, e-mail pmcnew@missc.state.wy.us or call (307) 777-7434.

Wetlands, Third Edition

Published by John Wiley & Sons, Inc., 2000

This book offers an overview of everything related to wetlands, from the role of crabs in mangrove swamps to the role of wetlands in global climate change. This edition offers new information on wetlands of the world, expanded coverage of Canadian wetlands, wetland laws and protection, wetland creation and restoration, treatment wetlands, gaseous emissions from wetlands, and

updated theories and classifications of salt marshes, peatlands, forested swamps, and riparian ecosystems. For more information and ordering information, visit

<http://www.aswm.org/propub/pubs/other/jw29232.htm>. 

If you'd like to publicize the availability of relevant information resources, please send information to restorationupdate@tetrattech-ffx.com.